

Chapter 296-835 WAC

DIPPING AND COATING OPERATIONS (DIP TANKS)

NEW SECTION

WAC 296-835-100 Scope.

IMPORTANT:

A **dip tank** is a container holding a liquid other than plain water that is used for dipping or coating. An object may be completely or partially immersed (in a dip tank) or it may be suspended in a vapor coming from the tank.

Exemption: Dip tanks that use a molten material (molten metal, alloy, salt, etc.) are not covered by this chapter.

This chapter **applies** to:

☛ A dip tank that uses a liquid other than plain water, or the vapor of the liquid, to:

- Clean an object
- Coat an object
- Alter the surface of an object

OR

- Change the character of an object.

☛ Draining or drying an object that has been dipped or coated.

Examples of covered dipping and coating operations include, but are not limited to:

- Paint dipping
- Electroplating
- Anodizing
- Pickling
- Quenching
- Tanning
- Degreasing
- Stripping
- Cleaning
- Dyeing
- Flow coating
- Roll coating.

Reference: You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See personal protective equipment (PPE), WAC 296-800-160, in the core rules, chapter 296-800 WAC.

NEW SECTION

WAC 296-835-110 General requirements. Summary.

Your responsibility:

Safeguard employees working with dip tanks.

You must:

CONSTRUCTION

Construct safe dip tanks

WAC 296-835-11005

VENTILATION

Provide proper ventilation for the vapor area

WAC 296-835-11010

Take additional precautions if you recirculate ventilation system exhaust air into the workplace

WAC 296-835-11015

Take additional precautions when using an exhaust hood

WAC 296-835-11020

INSPECTION

Periodically inspect your dip tanks and associated equipment and correct any deficiencies

WAC 296-835-11025

FIRST AID

Make sure employees working near dip tanks know appropriate first aid procedures

WAC 296-835-11030

CLEANING

Prepare dip tanks before cleaning

WAC 296-835-11035

CYANIDE

Safeguard cyanide tanks

WAC 296-835-11040

WELDING

Protect employees during welding, burning or other work using open flames

WAC 296-835-11045

LIQUIDS HARMFUL TO SKIN

Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin

WAC 296-835-11050.

CONSTRUCTION

NEW SECTION

WAC 296-835-11005 Construct safe dip tanks.

You must:

☛ Make sure dip tanks, including any drain boards, are strong enough to support the expected load.

VENTILATION

NEW SECTION

WAC 296-835-11010 Provide proper ventilation for the vapor area.

You must:

☛ Make sure mechanical ventilation meets the requirements of one or more of the following standards:

- NFPA 34-1995, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids
- ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (22nd ed., 1995)
- ANSI Z9.1-1971, Practices for Ventilation and Operation of Open-Surface Tanks and ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

Note: Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

You must:

☛ Limit the vapor area to the smallest practical space by using mechanical ventilation.

☛ Keep airborne concentration of any substance below twenty-five percent of its lower flammable limit (LFL).

☛ Make sure mechanical ventilation draws the flow of air into a hood or exhaust duct.

☛ Have a separate exhaust system for each dip tank if the combination of substances being removed could cause a:

- Fire
- Explosion

OR

- Potentially hazardous chemical reaction.

Reference: You need to keep employee exposure within safe levels when the liquid in a dip tank creates an exposure hazard. See Air contaminants, WAC 296-62-075 through 296-62-07515.

Note: You may use a tank cover or material that floats on the surface of the liquid to replace or assist ventilation. The method or combination of methods you choose has to maintain the airborne concentration of the hazardous material and the employee's exposure within safe limits.

NEW SECTION

WAC 296-835-11015 Take additional precautions if you recirculate ventilation system exhaust air into the workplace.

You must:

☞ Only recirculate air that contains no substance at a concentration that could pose a health or safety hazard to employees.

☞ Make sure any exhaust system that recirculates air into the workplace:

- Passes the air through a device that removes contaminants
- Sounds an alarm and automatically shuts down the dip tank operation, if the vapor concentration of any substance in the exhaust air exceeds twenty-five percent of its LFL
- Monitors the concentration of vapor from flammable or combustible liquids with approved equipment.

Note: ☞ The LFL concentration in the air must be determined after the air passes through the air-cleaning device and before the air reenters the workspace.

☞ Most substances will pose a health hazard at a concentration far below twenty-five percent of its LFL.

NEW SECTION

WAC 296-835-11020 Take additional precautions when using an exhaust hood.

You must:

☞ Make sure each room with an exhaust hood has a source of outside air that:

- Enters the room in a way that will not interfere with the function of the hood
- Replaces at least ninety percent of the air taken in through the hood.

INSPECTION

NEW SECTION

WAC 296-835-11025 Periodically inspect your dip tanks and associated equipment and correct any deficiencies.

You must:

☞ Inspect or test your dip tanks and associated equipment periodically, including:

- Covers
 - Overflow pipes
 - Bottom drains and valves
 - Electrical wiring, equipment, and grounding connections
 - Ventilating systems
 - Fire extinguishing equipment
 - ☞ Inspect the hoods and ductwork of the ventilation system for corrosion and damage and make sure the airflow is adequate:
 - At least quarterly during operation
 - Prior to operation after a prolonged shutdown
 - ☞ Promptly fix any deficiencies found.
- Note:**
- ☞ To assist you in tracking your inspections and actions taken from those inspections, you may want to keep a written record.
 - ☞ It is recommended that inspections be at least quarterly even if the system is not operating. Depending on the chemicals in use more frequent inspection may be required.

FIRST AID

NEW SECTION

WAC 296-835-11030 Make sure employees working near dip tanks know appropriate first-aid procedures.

You must:

☞ Make sure your employees know the appropriate first-aid procedures for the hazards of your dipping and coating operations.

Note: ☞ First-aid procedures are contained in the Material Safety Data Sheet (MSDS) for the chemicals used in the dip tank.

☞ First-aid supplies appropriate for the hazards of the dipping or coating operation need to be located near the dip tank to be considered "readily available" as required by WAC 296-800-15020.

Reference: There are additional requirements that may include providing emergency washing facilities and employee training. See first aid, WAC 296-800-150, and employer chemical hazard communication, WAC 296-800-170, in the safety and health core rules, chapter 296-800 WAC.

CLEANING

NEW SECTION

WAC 296-835-11035 Prepare dip tanks before cleaning.

You must:

- (1) Drain the contents of the tank and open any cleanout doors.
- (2) Ventilate the tank to clear any accumulated hazardous vapors.

Reference: There may be requirements that apply before an employee enters a dip tank. See Permit-required confined spaces, WAC 296-62-141 and safety procedures, chapter 296-24 WAC, Part A-4.

CYANIDE

NEW SECTION

WAC 296-835-11040 Safeguard cyanide tanks.

You must:

☞ Provide a dike or other safeguard(s) to prevent cyanide from mixing with an acid if a dip tank fails.

Note: This would also apply to spills or other means by which cyanide could come in contact with an acid in sufficient quantity to produce a hazardous gas.

WELDING

NEW SECTION

WAC 296-835-11045 Protect employees during welding, burning, or other work using open flames.

You must:

☞ Make sure the dip tank and the area around it are thoroughly cleaned of solvents and vapors before performing work involving:

- Welding
- Burning

OR

- Open flames

Reference: There are additional requirements for this type of work. See Welding, cutting and brazing, chapter 296-24 WAC, Part I, and Respiratory protection, chapter 296-62 WAC, Part E.

LIQUIDS HARMFUL TO SKIN

NEW SECTION

WAC 296-835-11050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.

You must:

(1) Make sure washing facilities, including hot water, are available for every ten employees that work with dip tank liquids.

(2) Satisfy medical requirements:

☛ Make sure an employee with any small skin abrasion, cut, rash, or open sore receives treatment by a properly designated person.

☛ Make sure an employee with a sore, burn, or other skin lesion that needs medical treatment, has a physician's approval before they perform their regular work.

☛ Make sure employees who work with chromic acid receive periodic examinations of their exposed body parts, especially their nostrils.

Note: ☛ Periodic means on a yearly basis unless otherwise indicated.

☛ Any time chromic acid spills onto an employee's skin or their clothing is saturated, a physician should be responsible for evaluating and monitoring the area where chromic acid made contact with the skin.

You must:

(3) Provide lockers or other storage space to prevent contamination of street clothes.

Reference: You have to do a hazard assessment to identify hazards or potential hazards in your workplace and determine if PPE is necessary to protect your employees. See Personal protective equipment (PPE), WAC 296-800-160, in the safety and health core rules, chapter 296-800 WAC.

NEW SECTION

WAC 296-835-120 Additional requirements for dip tanks using flammable or combustible liquids. Summary.

IMPORTANT:

This section applies to:

☛ Flammable and combustible liquids (flashpoint below 200°F)

☛ Liquids that have a flashpoint of 200°F (93.3°C) or higher if you:

- Heat the liquid

- Dip a heated object in the tank

Reference: Store flammable and combustible liquids as required by Flammable and combustible liquids, WAC 296-24-330, in the general safety and health standards.

Your responsibility:

Safeguard employees working with dip tanks containing flammable or combustible liquids

You must:

CONSTRUCTION

Include additional safeguards when constructing dip tanks

WAC 296-835-12005

Provide overflow pipes

WAC 296-835-12010

Provide bottom drains

WAC 296-835-12015

FIRE PROTECTION

Provide fire protection in the vapor area

WAC 296-835-12020

Provide additional fire protection for large dip tanks

WAC 296-835-12025

ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION

Prevent static electricity sparks or arcs when adding liquids to a dip tank

WAC 296-835-12035

Control ignition sources in the vapor area and adjacent area

WAC 296-835-12040

Provide safe wiring and electrical equipment where the liquid can drip or splash

WAC 296-835-12045

HOUSEKEEPING

Keep the area around dip tanks clear of combustible material and properly dispose of waste

WAC 296-835-12050

HEATING LIQUID

Make sure heating the liquid in your dip tanks does not cause a fire

WAC 296-835-12055

HEAT DRYING

Make sure a heating system used for drying objects does not cause a fire

WAC 296-835-12060

CONVEYORS

Make sure the conveyor system for dip tanks is safe

WAC 296-835-12065.

CONSTRUCTIONNEW SECTION

WAC 296-835-12005 Include additional safeguards when constructing dip tanks.

You must:

(1) Make sure the dip tank, drain boards (if provided), and supports, are made of noncombustible material.

(2) Make sure piping connections on drains and overflow pipes allow easy access to the inside of the pipe for inspection and cleaning.

NEW SECTION

WAC 296-835-12010 Provide overflow pipes.

You must:

☛ Provide an overflow pipe on dip tanks that:

- Hold more than one hundred fifty gallons of liquid
- OR
- Have more than ten square feet of liquid surface area
- ☛ Make sure the overflow pipe is:
 - Properly trapped
 - Able to prevent the dip tank from overflowing
 - Three inches or more (7.6 cm) in diameter
 - Discharged to a safe location.

Note: Discharged to a safe location could be a:

- Safe location outside the building

OR

- Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

You must:

- ☛ Make sure the bottom of the overflow pipe is at least six inches (15.2 cm) below the top of the tank.

Note: The overflow pipe should be large enough to remove water applied to the liquid surface of the dip tank from automatic sprinklers or other sources in the event of fire. Smaller dip tanks should be equipped with overflow pipes, if practical.

NEW SECTION

WAC 296-835-12015 Provide bottom drains.

Exemption: A bottom drain is not required if:

- The viscosity of the liquid makes it impractical to empty the tank by gravity or pumping

OR

- The dip tank has an automatic closing cover that meets the requirements of WAC 296-835-12030.

You must:

- ☛ Provide a bottom drain on all dip tanks that hold more than five hundred gallons of liquid.

☛ Make sure the bottom drain:

- Is properly trapped
- Will empty the dip tank during a fire
- Has pipes large enough to empty the tank within five minutes
- Uses automatic pumps if gravity draining is not practical
- Is capable of both manual and automatic operation
- Discharges to a safe location.

Note: Discharges to a safe location could be a:

- Safe location outside the building

OR

- Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

You must:

- ☛ Make sure manual operation of the bottom drain is performed from a safe and easily accessible location.

FIRE PROTECTION

NEW SECTION

WAC 296-835-12020 Provide fire protection in the vapor area. You must:

☛ Provide a manual fire extinguisher near the tank that is suitable for putting out flammable and combustible liquid fires.

NEW SECTION

WAC 296-835-12025 Provide additional fire protection for large dip tanks.

You must:

☛ Provide at least one automatic fire extinguishing system or an automatic dip tank cover if the tank:

– Holds one hundred fifty gallons or more of liquid

OR

– Has four square feet or more of liquid surface area.

☛ Make sure automatic fire extinguishing systems or automatic dip tank covers meet the requirements of Table 1.

Exemption: An automatic fire extinguishing system or an automatic dip tank cover is **not** required for a hardening or tempering tank that:

☛ Holds less than five hundred gallons

OR

☛ Has less than twenty-five square feet of liquid surface area.

Table 1: Automatic Fire Protection System

Requirements

IF YOU PROVIDE:	THEN YOU MUST:
An automatic fire extinguishing system	☛ Use extinguishing materials suitable for a fire fueled by the liquid in the tank ☛ Make sure the system protects the: – Tanks – Drain boards – Stock over drain boards.
A dip tank cover	☛ Make sure the cover is: – Closed by approved automatic devices in the event of fire – Able to be manually activated – Kept closed when the tank is not being used – Made of noncombustible material or metal-clad material with locked metal joints.

Reference: Automatic fire extinguishing systems have specific requirements. See:

- WAC 296-24-622 for automatic dry chemical extinguishing system requirements
- WAC 296-24-623 for automatic carbon dioxide extinguishing system requirements
- WAC 296-24-627 for automatic water spray extinguishing system and automatic foam extinguishing system requirements.

ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION

NEW SECTION

WAC 296-835-12035 Prevent static electricity sparks or arcs when adding liquids to a dip tank.

You must:

- ☛ Make sure any portable container used to add liquid to the tank is:
 - Electrically bonded to the dip tank
 - Positively grounded.

NEW SECTION

WAC 296-835-12040 Control ignition sources.

You must:

- (1) Make sure the vapor areas and adjacent areas do not have any:
 - ☛ Open flames.
 - ☛ Spark producing devices.
 - ☛ Heated surfaces hot enough to ignite vapors.
- (2) Use explosion-proof wiring and equipment in the vapor area.

Reference: Electrical wiring and equipment has to meet the requirements of the applicable hazardous (classified) location. See Hazardous (classified) locations, WAC 296-24-95613. Electrostatic equipment has specific electrical requirements. See WAC 296-835-13010.

You must:

- (3) Prohibit smoking in any vapor area:
 - ☛ Post an easily seen "NO SMOKING" sign near each dip tank.

NEW SECTION

WAC 296-835-12045 Provide safe electrical wiring and equipment where the liquid can drip or splash.

You must:

☞ Make sure all electrical wiring and equipment in the vapor area is approved for areas that have:

- Deposits of easily ignited residue
- Explosive vapor

Exemption: This does not apply to wiring that is:

- In rigid conduit, threaded boxes or fittings
- Has no taps, splices, or terminal connections.

HOUSEKEEPING

NEW SECTION

WAC 296-835-12050 Keep the area around dip tanks clear of combustible material and properly dispose of waste.

You must:

- (1) Make sure the area surrounding dip tanks is:
 - Completely free of combustible debris
 - As free of combustible stock as possible.
- (2) Provide approved metal waste cans that are:
 - Used for immediate disposal of rags and other material contaminated with liquids from dipping or coating operations
 - Emptied and the contents properly disposed of at the end of each shift.

HEATING LIQUID

NEW SECTION

WAC 296-835-12055 Make sure heating the liquid in your dip tanks does not cause a fire.

You must:

- ☞ Keep the temperature of the liquid in the dip tank:
 - Below the liquid's boiling point
 - At least 100°F below the liquid's autoignition temperature.

HEAT DRYING

NEW SECTION

WAC 296-835-12060 Make sure a heating system used for drying objects does not cause a fire.

You must:

☛ Make sure the heating system used in a drying operation that could cause ignition:

- Has adequate mechanical ventilation that operates before and during the drying operation
- Shuts down automatically if a ventilating fan fails to maintain adequate ventilation
- Is installed as required by NFPA 86-1999, Standard for Ovens and Furnaces.

Note: Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If you comply with a later version of a consensus standard, you will be considered to have complied with any previous version of the same consensus standard.

CONVEYORS

NEW SECTION

WAC 296-835-12065 Make sure conveyor systems are safe.

You must:

☛ Make sure the conveyor system shuts down automatically if:

- The ventilation system fails to maintain adequate ventilation

OR

- There is a fire.

NEW SECTION

WAC 296-835-130 Additional requirements for dip tanks used for specific processes. Summary.

Your responsibility: Safeguard employees working with dip tanks used for specific processes

You must:

HARDENING OR TEMPERING

Meet specific requirements if you use a hardening or tempering tank

WAC 296-835-13005

ELECTROSTATIC EQUIPMENT

Meet specific requirements if you use electrostatic equipment

WAC 296-835-13010

FLOW COATING

Meet specific requirements if you use flow coating

WAC 296-835-13015

ROLL COATING

Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C)

WAC 296-835-13020

VAPOR DEGREASING

Provide additional safeguards for vapor degreasing tanks

WAC 296-835-13025

SPRAY CLEANING OR DEGREASING

Control liquid spray over an open surface cleaning or degreasing tank

WAC 296-835-13030.

HARDENING OR TEMPERING

NEW SECTION

WAC 296-835-13005 Meet specific requirements if you use a hardening or tempering tank.

You must:

(1) Provide an automatic fire extinguishing system or an automatic dip tank cover for any hardening and tempering tank that uses flammable or combustible liquids and:

- Holds five hundred gallons (1893 L) or more of liquid

OR

- Has twenty-five square feet (2.37 m²) or more of liquid surface area.

(2) Prevent fires.

☛ Make sure hardening and tempering tanks are:

- **Not** located on or near combustible flooring.

- Located as far away as practical from furnaces.

- Equipped with noncombustible hoods and vents (or equally effective devices) for venting to the outside.

☛ Treat vent ducts as flues and keep them away from combustible material, particularly roofs.

(3) Make sure air under pressure is not used to:

☛ Fill the tank

OR

☛ Agitate the liquid in the tank.

(4) Equip each tank with an alarm that will sound when the temperature is within 50°F (10°C) of the liquid's flashpoint (alarm set point).

(5) Make sure a limit switch shuts down conveyors supplying work to the tank when the temperature reaches the alarm setpoint, if operationally practical.

(6) Have a circulating cooling system if the temperature of the liquid can exceed the alarm set point.

Note: The bottom drain of the tank may be combined with the oil circulating system if the requirements for bottom drains in WAC 296-835-12015 are satisfied.

ELECTROSTATIC EQUIPMENT

NEW SECTION

WAC 296-835-13010 Meet specific requirements if you use electrostatic equipment.

ELECTRICAL

You must:

(1) Provide safe electrical equipment.

☛ Make sure electrodes in your equipment are:

- Substantial
- Rigidly supported
- Permanently located
- Effectively insulated from ground by insulators

☛ Make sure the insulators are:

- Nonporous
- Noncombustible
- Kept clean and dry

☛ Make sure high voltage leads to electrodes are effectively:

- Supported on permanent, suitable insulators
- Guarded against accidental contact or grounding.

(2) Make sure transformers, powerpacks, control apparatus, and all other electrical parts of the equipment:

- Are located outside the vapor area

OR

- Meet the requirements of WAC 296-835-12040.

Exemption: High voltage grids and their connections may be located in the vapor area without meeting the requirements of WAC 296-835-12040.

PAINT DETEARING

You must:

(3) Safeguard paint detearing operations.

☛ Use approved electrostatic equipment in paint detearing operations.

(4) Make sure goods being paint deteared are:

- Supported on conveyors
- **Not** manually handled.

(5) Keep a minimum safe distance (twice the sparking distance) between goods being paint deteared and the electrodes or conductors of the electrostatic equipment at all times by:

- Arranging the conveyors to provide the necessary distance
- Supporting the goods to prevent swinging or movement, if necessary

☛ Post a sign that shows the minimum safe distance (twice the sparking distance) near the equipment, where it can be easily seen.

(6) Keep paint detearing operations separate from storage areas and people by using fences, rails or guards that are:

- Made of conducting material
- Adequately grounded.

(7) Protect paint detearing operations from fire by installing:

- Automatic sprinklers

OR

- An approved automatic fire extinguishing system.
- (8) Collect and remove paint deposits by:
 - Providing removable drip plates and screens
 - Cleaning these plates and screens in a safe location.

AUTOMATIC DISCONNECT REQUIREMENT

You must:

(9) Make sure electrostatic equipment has automatic controls that immediately disconnect the power supply to the high-voltage transformer and signal the operator, if:

- ☞ Ventilating fans or equipment stop or fail for any reason
- ☞ Conveyors do not work properly
- ☞ A ground (or imminent ground) occurs anywhere in the high-voltage system

OR

☞ Goods being paint deteared come within twice the sparking distance of the electrodes or conductors of the equipment.

FLOW COATING

NEW SECTION

WAC 296-835-13015 Meet specific requirements if you use a flow coating process.

You must:

(1) Make sure all piping is substantial and rigidly supported.

(2) Make sure the paint is supplied by a:

- ☞ Gravity tank that does not hold more than ten gallons (38 L)

OR

- ☞ Direct low-pressure pumping system.

(3) Have an approved heat-actuated device that shuts down the pumping system if there is a fire.

Note: The area of the sump, and any areas on which paint flows, should be included in the area of dip tank.

ROLL COATING

NEW SECTION

WAC 296-835-13020 Take additional precautions if your roll coating operation uses a liquid that has a flashpoint below 140°F (60°C).

IMPORTANT:

This section applies to the processes of roll coating, roll spreading,

or roll impregnating that use a liquid having a flashpoint below 140°F (60°C). Material may be passed directly through a tank or over the surface of a roller that revolves partially submerged in the liquid.

You must:

- ☞ Prevent sparks from static electricity by:
 - Bonding and grounding all metallic parts (including rotating parts) and installing static collectors

OR

- Maintaining a conductive atmosphere (one with a high relative humidity, for example) in the vapor area.

VAPOR DEGREASING

NEW SECTION

WAC 296-835-13025 Provide additional safeguards for vapor degreasing tanks.

You must:

(1) Make sure, if the tank has a condenser or a vapor-level thermostat, that it keeps the vapor level at least:

- ☞ Thirty-six inches (91 cm) below the top of the tank if the width of the tank is seventy-two inches or more

OR

- ☞ One-half the tank width below the top of the tank if the tank is less than seventy-two inches wide.

(2) Make sure, if you use gas as a fuel to heat the tank liquid, that the combustion chamber is airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.

(3) Make sure the exhaust flue:

- ☞ Is made of corrosion-resistant material

- ☞ Extends to the outside

- ☞ Has a draft diverter if mechanical exhaust is used.

(4) Take special precautions to keep solvent vapors from mixing with the combustion air of the heater if chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene or freon) are used in the dip tank.

(5) Keep the temperature of the heating element low enough to keep a solvent or mixture from:

- ☞ Decomposing

OR

- ☞ Generating excessive vapor.

SPRAY CLEANING OR DEGREASING

NEW SECTION

WAC 296-835-13030 Control liquid spray over an open surface cleaning or degreasing tank.

You must:

- ☛ Control the spray to the greatest extent feasible by:
 - Enclosing the spraying operation as completely as possible
 - Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.

Note: Mechanical baffles may be used to help prevent the discharge of spray.

Reference: Spray painting operations are covered in Spray finishing using flammable and combustible materials, WAC 296-24-370, and Spray-finishing operations, WAC 296-62-11019.

NEW SECTION

WAC 296-835-140 Definitions. **ACGIH:** American Conference of Governmental Industrial Hygienists.

Adjacent area: Any area within twenty feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.

ANSI: American National Standards Institute.

Approved: Approved or listed by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7, for definition of nationally recognized testing laboratory.

Autoignition temperature: The minimum temperature required to cause self-sustained combustion without any other source of heat.

Combustible liquid: A liquid having a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). Mixtures with at least ninety-nine percent of their components having flashpoints of 200°F (93.3°C) or higher are not considered combustible liquids.

Detearing: A process for removing excess wet coating material from the bottom edge of a dipped or coated object or material by passing it through an electrostatic field.

Dip tank: A container holding a liquid other than plain water that is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.

Flammable liquid: Any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

Flashpoint: The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by any of the measurement methods described in the definition of flashpoint in the safety and health core rules, WAC 296-800-370.

Lower flammable limit: The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).

NFPA: National Fire Protection Association.

Vapor area: Any area in the vicinity of dip tanks, their drain boards or associated drying, conveying, or other equipment where the vapor concentration could exceed twenty-five percent of the lower flammable limit (LFL) for the liquid in the tank.

You: Means the employer. See the definition of employer in the safety and health core rules, WAC 296-800-370.

AMENDATORY SECTION (Amending WSR 01-11-038, filed 5/9/01, effective 9/1/01)

WAC 296-62-11021 Open surface tanks.

Note: The requirements in this section apply only to agriculture. The general industry requirements relating to dipping and coating operations (dip tanks) have been moved to chapter 296-835 WAC.

(1) General.

(a) This section applies to all operations involving the immersion of materials in liquids, or in the vapors of such liquids, for the purpose of cleaning or altering the surface or adding to or imparting a finish thereto or changing the character of the materials, and their subsequent removal from the liquid or vapor, draining, and drying. These operations include washing, electroplating, anodizing, pickling, quenching, dyeing, dipping, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, digesting, and other similar operations.

(b) Except where specific construction specifications are prescribed in this section, hoods, ducts, elbows, fans, blowers, and all other exhaust system parts, components, and supports thereof shall be so constructed as to meet conditions of service and to facilitate maintenance and shall conform in construction to the specifications contained in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960.

(2) Classification of open-surface tank operations.

(a) Open-surface tank operations shall be classified into 16 classes, numbered A-1 to D-4, inclusive.

(b) Determination of class. Class is determined by two factors, hazard potential designated by a letter from A to D, inclusive, and rate of gas, vapor, or mist evolution designated by a number from 1 to 4, inclusive (for example, B.3).

(c) Hazard potential is an index, on a scale of from A to D, inclusive, of the severity of the hazard associated with the substance contained in the tank because of the toxic, flammable, or explosive nature of the vapor, gas, or mist produced therefrom. The toxic hazard is determined from the concentration, measured in parts by volume of a gas or vapor, per million parts by volume of contaminated air (ppm), or in milligrams of mist per cubic meter of air (mg/m³), below which ill effects are unlikely to occur to the exposed worker. The concentrations shall be those in WAC 296-62-075 through 296-62-07515.

(d) The relative fire or explosion hazard is measured in degrees Fahrenheit in terms of the closed-cup flash point of the substance in the tank. Detailed information on the prevention of fire hazards in dip tanks may be found in Dip Tanks Containing Flammable or Combustible Liquids, NFPA No. 34-1966, National Fire Protection Association. Where the tank contains a mixture of liquids, other than organic solvents, whose effects are additive, the hygienic standard of the most toxic component (for example, the one having the lowest ppm or mg/m³) shall be used, except where such substance constitutes an insignificantly small fraction of the mixture. For mixtures of organic solvents, their combined effect, rather than that of either individually, shall determine the hazard potential. In the absence of information to the contrary, the effects shall be considered as additive. If the sum of the ratios of the airborne concentration of that contaminant exceeds unity, the toxic concentration shall be considered to have been exceeded. (See Note A of (2)(e) of this section.)

(e) Hazard potential shall be determined from Table 16, with the value indicating greater hazard being used. When the hazardous material may be

either a vapor with a permissible exposure limit in ppm or a mist with a TLV in mg/m³, the TLV indicating the greater hazard shall be used (for example, A takes precedence over B or C; B over C; C over D).

Note A:

$$\frac{c_1}{\text{PEL}} + \frac{c_2}{\text{PEL}} + \frac{c_3}{\text{PEL}} + \dots + \frac{c_N}{\text{PEL}} > 1$$

where:

c = Concentration measured at the operation in ppm.

TABLE 16
DETERMINATION OF HAZARD POTENTIAL

Hazard potential	Toxicity Group			
	Gas or vapor (ppm)	Mist (mg/m ³)		Flash point (in degrees F.)
A	0 - 10	0	- 0.1
B	11 - 100	0.11	- 1.0	Under 100
C	101 - 500	1.1	- 10	100-200
D	Over 500	Over 10		Over 200

(f) Rate of gas, vapor, or mist evolution is a numerical index, on a scale of from 1 to 4, inclusive, both of the relative capacity of the tank to produce gas, vapor, or mist and of the relative energy with which it is projected or carried upwards from the tank. Rate is evaluated in terms of;

- (i) The temperature of the liquid in the tank in degrees Fahrenheit;
- (ii) The number of degrees Fahrenheit that this temperature is below the boiling point of the liquid in degrees Fahrenheit;
- (iii) The relative evaporation of the liquid in still air at room temperature in an arbitrary scale--fast, medium, slow, or nil; and
- (iv) The extent that the tank gases or produces mist in an arbitrary scale--high, medium, low, and nil. (See Table 17, Note 2.) Gassing depends upon electrochemical or mechanical processes, the effects of which have to be individually evaluated for each installation (see Table 17, Note 3).

(g) Rate of evolution shall be determined from Table 17. When evaporation and gassing yield different rates, the lowest numerical value shall be used.

TABLE 17
DETERMINATION OF RATE OF GAS,
VAPOR, OR MIST EVOLUTION¹

Rate	Liquid temperature, °F	Degrees below boiling point	Evaporation ²	Relative Gassing ³
1	Over 200	0-20	Fast	High
2	150-200	21-50	Medium ...	Medium
3	94-149	51-100	Slow	Low

Note 1. In certain classes of equipment, specifically vapor degreasers, an internal condenser or vapor level thermostat is used to prevent the vapor from leaving the tank during normal operations. In such cases, rate of vapor evolution from the tank into the workroom is not dependent upon the factors listed in the table, but rather upon abnormalities of operating procedure, such as carry out of vapors from excessively fast action, dragout of liquid by entrainment in parts, contamination of solvent by water and other materials, or improper heat balance. When operating procedure is excellent, effective rate of evolution may be taken as 4. When operating procedures are average, the effective rate of evolution may be taken as 3. When operation is poor, a rate of 2 or 1 is indicated, depending upon observed conditions.

Note 2. Relative evaporation rate is determined according to the methods described by A. K. Doolittle in Industrial and Engineering Chemistry, vol. 27, p. 1169, (3) where time for 100-- percent evaporation is as follows: Fast: 0-3 hours; Medium: 3-12 hours; Slow: 12-50 hours; Nil: more than 50 hours.

Note 3. Gassing means the formation by chemical or electrochemical action of minute bubbles of gas under the surface of the liquid in the tank and is generally limited to aqueous solutions.

(3) Ventilation. Where ventilation is used to control potential exposures to workers as defined in (2)(c) of this section, it shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation are discussed in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960.

(4) Control requirements.

(a) Control velocities shall conform to Table 18 in all cases where the flow of air past the breathing or working zone of the operator and into the

hoods is undisturbed by local environmental conditions, such as open windows, wall fans, unit heaters, or moving machinery.

(b) All tanks exhausted by means of hoods which;

(i) Project over the entire tank;

(ii) Are fixed in position in such a location that the head of the workman, in all his normal operating positions while working at the tank, is in front of all hood openings; and

(iii) Are completely enclosed on at least two sides, shall be considered to be exhausted through an enclosing hood.

(iv) The quantity of air in cubic feet per minute necessary to be exhausted through an enclosing hood shall be not less than the product of the control velocity times the net area of all openings in the enclosure through which air can flow into the hood.

TABLE 18
CONTROL VELOCITIES IN FEET PER MINUTE (F.P.M.) FOR
UNDISTURBED LOCATIONS

Class (See Sub- paragraph (2) and Tables 16 and 17)	Enclosing hood (See Subparagraph (4)(ii))		Lateral exhaust ¹ (See Subparagraph (4)(iii))	Canopy hood ² (See Sub- paragraph (4)(iv))	
	One open side	Two open sides		Three open sides	Four open sides
A-1 and A-2 ———	100	150	150	Do not use	Do not use
A-3 (Note ²), B-1, B-2, and C-1 ———	75	100	100	125	175
B-3, C-2, and D-1 (Note ³) ———	65	90	75	100	150
A-4 (Note ²), C-3, and D-2 (Note ³) ———	50	75	50	75	125
B-4, C-4, D-3 (Note ³), and D-4 ———					
General room ventilation required.					

¹ See Table 19 for computation of ventilation rate.

² Do not use canopy hood for Hazard Potential A processes.

³ Where complete control of hot water is desired, design as next highest class.

(c) All tanks exhausted by means of hoods which do not project over the entire tank, and in which the direction of air movement into the hood or hoods is substantially horizontal, shall be considered to be laterally exhausted. The quantity of air in cubic feet per minute necessary to be laterally exhausted per square foot of tank area in order to maintain the required control velocity shall be determined from Table 19 for all variations in ratio of tank width (W) to tank length (L). The total quantity of air in cubic feet per minute required to be exhausted per tank shall be

not less than the product of the area of tank surface times the cubic feet per minute per square foot of tank area, determined from Table 19.

(i) For lateral exhaust hoods over 42 inches wide, or where it is desirable to reduce the amount of air removed from the workroom, air supply slots or orifices shall be provided along the side or the center of the tank opposite from the exhaust slots. The design of such systems shall meet the following criteria:

(A) The supply air volume plus the entrained air shall not exceed 50 percent of the exhaust volume.

(B) The velocity of the supply airstream as it reaches the effective control area of the exhaust slot shall be less than the effective velocity over the exhaust slot area.

(C) The vertical height of the receiving exhaust hood, including any baffle, shall not be less than one-quarter the width of the tank.

(D) The supply airstream shall not be allowed to impinge on obstructions between it and the exhaust slot in such a manner as to significantly interfere with the performance of the exhaust hood.

TABLE 19
MINIMUM VENTILATION RATE IN CUBIC FEET OF AIR PER
MINUTE PER SQUARE FOOT OF TANK AREA FOR LATERAL
EXHAUST

Required minimum control velocity, f.p.m. (from Table	C.f.m. per sq. ft. to maintain required minimum velocities at following ratios (tank width (W)/tank length (L)). ^{1 3}				
	0.0- 0.09	0.1- 0.24	0.25- 0.49	0.5- 0.99	1.0- 2.0
Hood along one side or two parallel sides of tank when one hood is against a wall or baffle. ²					
Also for a manifold along tank centerline. ³					
50		50	60	75	90
75		75	90	110	130
100		100	125	150	175
150		150	190	225	260
Hood along one side or two parallel sides of free standing tank not against wall or baffle.					
50		75	90	100	110
75		110	130	150	170
100		150	175	200	225
150		225	260	300	340

¹ It is not practicable to ventilate across the long dimension of a tank whose ratio W/L exceeds 2.0.
It is understandable to do so when W/L exceeds 1.0. For circular tanks with lateral exhaust along up

the circumference use $W/L = 1.0$
for over one-half the circumference
use $W/L = 0.5$.

- ² Baffle is a vertical plate the same length as the tank, and with the top of the plate as high as the tank is wide. If the exhaust hood is on the side of a tank against a building wall or close to it, it is perfectly baffled.

- ³ Use W/L as tank width in computing when manifold is along centerline, or when hoods are used on two parallel sides of a tank.

Tank Width (W) means the effective width over which the hood must pull air to operate (for example, where the hood face is not back from the edge of the tank, this set back must be added in measuring tank width). The surface area of tanks can frequently be reduced and better control obtained (particularly on conveyorized systems) by using covers extending from the upper edges of the slots toward the center of the tank.

(E) Since most failure of push-pull systems result from excessive supply air volumes and pressures, methods of measuring and adjusting the supply air shall be provided. When satisfactory control has been achieved, the adjustable features of the hood shall be fixed so that they will not be altered.

(d) All tanks exhausted by means of hoods which project over the entire tank, and which do not conform to the definition of enclosing hoods, shall be considered to be overhead canopy hoods. The quantity of air in cubic feet per minute necessary to be exhausted through a canopy hood shall be not less than the product of the control velocity times the net area of all openings between the bottom edges of the hood and the top edges of the tank.

(e) The rate of vapor evolution (including steam or products of combustion) from the process shall be estimated. If the rate of vapor evolution is equal to or greater than 10 percent of the calculated exhaust volume required, the exhaust volume shall be increased in equal amount.

(5) Spray cleaning and degreasing. Wherever spraying or other mechanical means are used to disperse a liquid above an open-surface tank, control must be provided for the airborne spray. Such operations shall be enclosed as completely as possible. The inward air velocity into the enclosure shall be sufficient to prevent the discharge of spray into the workroom. Mechanical baffles may be used to help prevent the discharge of spray. Spray painting operations are covered in WAC 296-62-11019.

(6) Control means other than ventilation. Tank covers, foams, beads, chips, or other materials floating on the tank surface so as to confine gases, mists, or vapors to the area under the cover or to the foam, bead, or chip layer; or surface tension depressive agents added to the liquid in the tank to minimize mist formation, or any combination thereof, may all be used as gas, mist, or vapor control means for open-surface tank operations, provided that they effectively reduce the concentrations of hazardous materials in the vicinity of the worker below the limits set in accordance with (2) of this section.

(7) System design.

(a) The equipment for exhausting air shall have sufficient capacity to produce the flow of air required in each of the hoods and openings of the system.

(b) The capacity required in (7)(a) of this section shall be obtained when the airflow producing equipment is operating against the following pressure losses, the sum of which is the static pressure:

(i) Entrance losses into the hood.
(ii) Resistance to airflow in branch pipe including bends and transformations.
(iii) Entrance loss into the main pipe.
(iv) Resistance to airflow in main pipe including bends and transformations.
(v) Resistance of mechanical equipment; that is, filters, washers, condensers, absorbers, etc., plus their entrance and exit losses.
(vi) Resistance in outlet duct and discharge stack.
(c) Two or more operations shall not be connected to the same exhaust system where either one or the combination of the substances removed may constitute a fire, explosion, or chemical reaction hazard in the duct system. Traps or other devices shall be provided to insure that condensate in ducts does not drain back into any tank.
(d) The exhaust system, consisting of hoods, ducts, air mover, and discharge outlet shall be designed in accordance with American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, or the manual, Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists. Airflow and pressure loss data provided by the manufacturer of any air cleaning device shall be included in the design calculations.

(8) Operation.

(a) The required airflow shall be maintained at all times during which gas, mist, or vapor is emitted from the tank, and at all times the tank, the draining, or the drying area is in operation or use. When the system is first installed, the airflow from each hood shall be measured by means of a pitot traverse in the exhaust duct and corrective action taken if the flow is less than that required. When the proper flow is obtained, the hood static pressure shall be measured and recorded. At intervals of not more than 3 months operation, or after a prolonged shutdown period, the hoods and duct system shall be inspected for evidence of corrosion or damage. In any case where the airflow is found to be less than required, it shall be increased to the required value. (Information on airflow and static pressure measurement and calculations may be found in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, or in the manual, Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists.)

(b) The exhaust system shall discharge to the outer air in such a manner that the possibility of its effluent entering any building is at a minimum. Recirculation shall only be through a device for contaminant removal which will prevent the creation of a health hazard in the room or area to which the air is recirculated.

(c) A volume of outside air in the range of 90 percent to 110 percent of the exhaust volume shall be provided to each room having exhaust hoods. The outside air supply shall enter the workroom in such a manner as not to be detrimental to any exhaust hood. The airflow of the makeup air system shall be measured on installation. Periodically, thereafter, the airflow should be remeasured, and corrective action shall be taken when the airflow is below that required. The makeup air shall be uncontaminated.

(9) Personal protection.

(a) All employees working in and around open surface tank operations must be instructed as to the hazards of their respective jobs, and in the personal protection and first aid procedures applicable to these hazards.

(b) All persons required to work in such a manner that their feet may become wet shall be provided with rubber or other impervious boots or shoes, rubbers, or wooden-soled shoes sufficient to keep feet dry.

(c) All persons required to handle work wet with a liquid other than water shall be provided with gloves impervious to such a liquid and of a length sufficient to prevent entrance of liquid into the tops of the gloves.

The interior of gloves shall be kept free from corrosive or irritating contaminants.

(d) All persons required to work in such a manner that their clothing may become wet shall be provided with such aprons, coats, jackets, sleeves, or other garments made of rubber, or of other materials impervious to liquids other than water, as are required to keep their clothing dry. Aprons shall extend well below the top of boots to prevent liquid splashing into the boots. Provision of dry, clean, cotton clothing along with rubber shoes or short boots and an apron impervious to liquids other than water shall be considered a satisfactory substitute where small parts are cleaned, plated, or acid dipped in open tanks and rapid work is required.

(e) Whenever there is a danger of splashing, for example, when additions are made manually to the tanks, or when acids and chemicals are removed from the tanks, the employees so engaged shall be required to wear either tight-fitting chemical goggles or an effective face shield. (~~((See WAC 296-800-160.))~~) (See chapter 296-307 WAC, Part H, Personal protective equipment.)

(f) When, during emergencies as described in (11)(e) of this section, employees must be in areas where concentrations of air contaminants are greater than the limit set by (2)(c) of this section or oxygen concentrations are less than 19.5%, they must be required to wear respirators adequate to reduce their exposure to a level below these limits or that provide adequate oxygen. Such respirators must also be provided in marked, quickly accessible storage compartments built for the purpose, when there exists the possibility of accidental release of hazardous concentrations of air contaminants. Respirators must be certified by NIOSH under 42 CFR part 84 and used in accordance with the applicable provisions of chapter 296-62 WAC Part E.

(g) Near each tank containing a liquid which may burn, irritate, or otherwise be harmful to the skin if splashed upon the worker's body, there shall be a supply of clean cold water. The water pipe (carrying a pressure not exceeding 25 pounds) shall be provided with a quick opening valve and at least 48 inches of hose not smaller than three-fourths inch, so that no time may be lost in washing off liquids from the skin or clothing. Alternatively, deluge showers and eye flushes shall be provided in cases where harmful chemicals may be splashed on parts of the body.

(h) Operators with sores, burns, or other skin lesions requiring medical treatment shall not be allowed to work at their regular operations until so authorized by a physician. Any small skin abrasions, cuts, rash, or open sores which are found or reported shall be treated by a properly designated person so that chance of exposures to the chemicals are removed. Workers exposed to chromic acids shall have a periodic examination made of the nostrils and other parts of the body, to detect incipient ulceration.

(i) Sufficient washing facilities, including soap, individual towels, and hot water, shall be provided for all persons required to use or handle any liquids which may burn, irritate, or otherwise be harmful to the skin, on the basis of at least one basin (or its equivalent) with a hot water faucet for every 10 employees. (~~((See WAC 296-800-230.))~~) (See chapter 296-307 WAC, Safety standards for agriculture.)

(j) Locker space or equivalent clothing storage facilities shall be provided to prevent contamination of street clothing.

(k) First aid facilities specific to the hazards of the operations conducted shall be readily available.

(10) Special precautions for cyanide. Dikes or other arrangements shall be provided to prevent the possibility of intermixing of cyanide and acid in the event of tank rupture.

(11) Inspection, maintenance, and installation.

(a) Floors and platforms around tanks shall be prevented from becoming slippery both by original type of construction and by frequent flushing. They shall be firm, sound, and of the design and construction to minimize the

possibility of tripping.

(b) Before cleaning the interior of any tank, the contents shall be drained off, and the cleanout doors shall be opened where provided. All pockets in tanks or pits, where it is possible for hazardous vapors to collect, shall be ventilated and cleared of such vapors.

(c) Tanks which have been drained to permit employees to enter for the purposes of cleaning, inspection, or maintenance may contain atmospheres which are hazardous to life or health, through the presence of flammable or toxic air contaminants, or through the absence of sufficient oxygen. Before employees shall be permitted to enter any such tank, appropriate tests of the atmosphere shall be made to determine if the limits set by (2)(c) of this section are exceeded, or if the oxygen concentration is less than 19.5%.

(d) If the tests made in accordance with (11)(c) of this section indicate that the atmosphere in the tank is unsafe, before any employee is permitted to enter the tank, the tank shall be ventilated until the hazardous atmosphere is removed, and ventilation shall be continued so as to prevent the occurrence of a hazardous atmosphere as long as an employee is in the tank.

(e) If, in emergencies, such as rescue work, it is necessary to enter a tank which may contain a hazardous atmosphere, suitable respirators, such as self-contained breathing apparatus; hose mask with blower, if there is a possibility of oxygen deficiency; or a gas mask, selected and operated in accordance with (9)(f) of this section, shall be used. If a contaminant in the tank can cause dermatitis, or be absorbed through the skin, the employee entering the tank shall also wear protective clothing. At least one trained standby employee, with suitable respirator, shall be present in the nearest uncontaminated area. The standby employee must be able to communicate with the employee in the tank and be well able to haul him out of the tank with a lifeline if necessary.

(f) Maintenance work requiring welding or open flame, where toxic metal fumes such as cadmium, chromium, or lead may be evolved, shall be done only with sufficient local exhaust ventilation to prevent the creation of a health hazard, or be done with respirators selected and used in accordance with (9)(f) of this section. Welding, or the use of open flames near any solvent cleaning equipment shall be permitted only after such equipment has first been thoroughly cleared of solvents and vapors.

(12) Vapor degreasing tanks.

(a) In any vapor degreasing tank equipped with a condenser and vapor level thermostat, the condenser or thermostat shall keep the level of vapors below the top edge of the tank by a distance at least equal to one-half the tank width, or at least 36 inches, whichever is shorter.

(b) Where gas is used as a fuel for heating vapor degreasing tanks, the combustion chamber shall be of tight construction, except for such openings as the exhaust flue, and those that are necessary for supplying air for combustion. Flues shall be of corrosion-resistant construction and shall extend to the outer air. If mechanical exhaust is used on this flue, a draft diverter shall be used. Special precautions must be taken to prevent solvent fumes from entering the combustion air of this or any other heater when chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene; Freon) are used.

(c) Heating elements shall be so designed and maintained that their surface temperature will not cause the solvent or mixture to decompose, break down, or be converted into an excessive quantity of vapor.

(d) Tanks or machines of more than 4 square feet of vapor area, used for solvent cleaning or vapor degreasing, shall be equipped with suitable cleanout or sludge doors located near the bottom of each tank or still. These doors shall be so designed and gasketed that there will be no leakage of solvent when they are closed.

(13) Scope.

(a) This paragraph applies to all operations involving the immersion of materials in liquids, or in the vapors of such liquids, for the purpose of cleaning or altering their surfaces, or adding or imparting a finish thereto, or changing the character of the materials, and their subsequent removal from the liquids or vapors, draining, and drying. Such operations include washing, electroplating, anodizing, pickling, quenching, dyeing, dipping, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, digesting, and other similar operations, but do not include molten materials handling operations, or surface coating operations.

(b) "Molten materials handling operations" means all operations, other than welding, burning, and soldering operations, involving the use, melting, smelting, or pouring of metals, alloys, salts, or other similar substances in the molten state. Such operations also include heat treating baths, descaling baths, die casting stereotyping, galvanizing, tinning, and similar operations.

(c) "Surface coating operations" means all operations involving the application of protective, decorative, adhesive, or strengthening coating or impregnation to one or more surfaces, or into the interstices of any object or material, by means of spraying, spreading, flowing, brushing, roll coating, pouring, cementing, or similar means; and any subsequent draining or drying operations, excluding open-tank operations.

AMENDATORY SECTION (Amending WSR 01-11-038, filed 5/9/01, effective 9/1/01)

WAC 296-78-71015 Tanks and chemicals. (1) All open vats and tanks into which workers may fall shall be guarded with standard railings or screen guards in all cases where such guarding is possible with regard to practical operation.

(2) Foundations of elevated tanks shall be accessible for inspections. When the tank platform is more than five feet above the ground a stairway or ladder shall be permanently attached.

(3) Every open tank over five feet in height shall be equipped with fixed standard ladders both inside and out, extending from the bottom to the rim of the tank arranged to be accessible to each other, so far as local conditions permit.

(4) The use of chemicals for treating of lumber for prevention of sap stain or mold or as preservatives, shall conform to the requirements of ((~~WAC 296-62-11021, open surface tanks~~)) chapter 296-835 WAC, Dipping and coating operations (dip tanks).

(a) Storage, handling, and use of chemicals. Threshold limits. Employees shall not be exposed to airborne concentration of toxic dusts, vapors, mists or gases that exceed the threshold limit values set forth in chapter ((~~296-24~~)) 296-62 WAC, Part ((~~A-2, general safety and health standards~~)) H, and chapter 296-62 WAC, Part E, general occupational health standards.

(b) Protective equipment. The use of chemicals shall be controlled so as to protect employees from harmful exposure to toxic materials. Where necessary, employees shall be provided with and required to wear such protective equipment as will afford adequate protection against harmful exposure as required by ((~~chapter 296-24 WAC, Part A-2, general safety and health standards~~)) WAC 296-800-160, and chapter 296-62 WAC, Part E, general occupational health standards.

(5)(a) Means shall be provided and used to collect any excess of chemicals used in treating lumber so as to protect workers from accidental contact with harmful concentrations of toxic chemicals or fumes.

(b) Dip tanks containing flammable or combustible liquids shall be constructed, maintained and used in accordance with ((~~WAC 296-24-405 of the general safety and health standards~~)) chapter 296-835 WAC, Dipping and coating operations (dip tanks).

(c) An evacuation plan shall be developed and implemented for all employees working in the vicinity of dip tanks using flammable and/or combustible liquids. A copy of the plan shall be available at the establishment for inspection at all times. Every employee shall be made aware of the evacuation plan and know what to do in the event of an emergency and be evacuated in accordance with the plan. The plan shall be reviewed with employees at least quarterly and documented.

(d) When automatic foam, automatic carbon dioxide or automatic dry chemical extinguishing systems are used, an alarm device shall be activated to alert employees in the dip tank area before and during the activation of the system. The following combinations of extinguishment systems when used in conjunction with the evacuation plan as stated above will be acceptable in lieu of bottom drains:

(i) A dip tank cover with an automatic foam extinguishing system under the cover, or an automatic carbon dioxide system, or an automatic dry chemical extinguishing system, or an automatic water spray extinguishing

system;

(ii) An automatic dry chemical extinguishing system with an automatic carbon dioxide system or a second automatic dry chemical extinguishing system or an automatic foam extinguishing system;

(iii) An automatic carbon dioxide system with a second automatic carbon dioxide system or an automatic foam extinguishing system.

(e) The automatic water spray extinguishing systems, automatic foam extinguishing systems, and dip tank covers shall conform with the requirements of (~~WAC 296-24-405~~) chapter 296-835 WAC, Dipping and coating operations (dip tanks). The automatic carbon dioxide systems and dry chemical extinguishing system shall conform with the requirements of WAC 296-24-615 and 296-24-620.

(6) Where workers are engaged in the treating of lumber with chemicals or are required to handle lumber or other materials so treated, the workers shall be provided with, at no cost to the worker, and required to use such protective equipment as will provide complete protection against contact with toxic chemicals or fumes therefrom.

(7) Sanitation requirements. The requirements of WAC 296-800-220 and 296-800-230 (safety and health core rules), shall govern sanitation practices.

(8) The sides of steam vats and soaking pits unless otherwise guarded shall extend forty-two inches above the floor level. The floor adjacent thereto shall be of nonslip construction.

(9) Large steam vats or soaking pits, divided into sections, shall be provided with substantial walkways between each section, each walkway to be provided with standard railings which may be removable if necessary.

(10) Covers shall be removed only from that portion of the steaming vats on which workers are working and a portable railing shall be placed at this point to protect the operators.

(11) Workers shall not ride or step on logs in steam vats.

REPEALER

The following sections of the Washington Administrative Code are repealed:

WAC 296-24-405	Dip tanks containing flammable or combustibile liquids.
WAC 296-24-40501	Definitions.
WAC 296-24-40503	Ventilation.
WAC 296-24-40505	Construction of dip tanks.
WAC 296-24-40507	Liquids used in dip tanks, storage and handling.
WAC 296-24-40509	Electrical and other sources of ignition.
WAC 296-24-40511	Operations and maintenance.
WAC 296-24-40513	Extinguishment.
WAC 296-24-40515	Special dip tank applications.